

GOFF BLAST WHEEL MAINTENANCE & ASSEMBLY MANUAL



Parts & Machinery for the Abrasive Blast Industry

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INTRODUCTION

These instructions are intended for maintenance personnel for the maintenance and/or repair of the indicated blast wheel assembly. Disassembly and reassembly requires expertise and must be performed by personnel that are knowledgeable about the assembly. Please contact Coyote should you have any questions.

GENERAL DESCRIPTION

The Blast Wheel Assembly is the most vital part of any Airless Blast Cleaning System, thus the operating efficiency depends entirely upon the proper inspection, assembly, and adjustment of the Blast Wheel there will be constant war on internal parts making periodic inspection and replacement essential.

It is important to keep in mind that the very nature of this device requires that some of the parts be constructed using extremely hard and wear resistant materials. This hardness cannot be attained without making the wear parts brittle. When handling these parts (Blades, Impeller, Control Cage and Liners) they should be considered as cast glass. A sharp blow with a drift or pry bar can result in chips flying off with explosive force. Flying chips may also result from accidentally or carelessly knocking hardened parts together. When working with Blast Wheel components, always wear gloves and safety glasses. The efficiency of this equipment, the blast cycle time and the production requirements will all depend largely on the conditions under which the Blast Wheel is operated and maintained. Compliance with the instructions and suggestions given in this manual should result in a highly efficient and productive Blast Cleaning System. In brief, the Blast Wheel Assembly functions as follows: The Abrasive Valve feeds a controlled amount of Abrasive (Steel Shot or Grit) through the Feed Spout to the Impeller, revolving at a high speed, moves the Abrasive through the Control Cage opening into the path of the revolving Blades. The Blades, by means of centrifugal force, throw a controlled pattern of Abrasive at the work surface. The Blast Wheel by throwing millions of particles of Abrasive per minute at a tremendous velocity provides an economical and thorough method of cleaning.



INSPECTION OF THE WEARING PARTS

- 1. Open the manually operated disconnect at the Control Panel and Tag Switch so that the machine cannot be energized.
- 2. Remove Blast Housing Lid by loosening Nuts on each end of the Lid, rotating the Clevis Brackets outward and lifting the Lid upward.
- 3. Remove the Top Liners to give access to the Blast Wheel assembly.
- 4. Rotate Blades by hand and inspect them for wear. Vibration of the Blast Wheel when operating is usually an indication of an excessively worn or broken Blade. Whenever Blades are deeply grooved, worn to half their original thickness or broken they should be replaced with a new matching set. Never attempt to replace anything less than a full set of Blades. The Blades are carefully weighed and balanced in matched sets and should never be separated.
- 5. Make a visual inspection of the Control Cage opening. The sides of the opening should be straight. When grooves or notches develop around the Cage opening, it should be replaced.
- 6. While rotating the Blades by hand it is possible to see the leading edge of the Impeller fingers. When the fingers become grooved or worn to half their original size, the impeller should be replaced.
- 7. The Feed Spout wears very slowly so the inspection of this part usually involves checking for cracks or other physical damage.
- 8. Blast Wheel Liners should be replaced when they become worn to half their original thickness. Allowing the Blast Wheel Liners to wear through will result in damage to the Blast Wheel Housing.

NOTE: The wearable parts of the Blast Wheel should be inspected every 10-20 blast hours. Doing so will ensure that worn parts can be replaced as needed to keep the Blast Wheel running at peak efficiency while guarding against unnecessary damage.



BLAST WHEEL HOUSING LINERS

The Blast Housing Liners are identified as follows:

- > Top Liner Part Number: C5001936 (1 PC) or C5001936-001L or 002R (2 Pc)
- ► End Liner Part Number: C5001937 (Short) or C5002308 (Long).
- Side Liner Part Number: C5001938 (Rear Side) or C5001939 (Front Side)

These Liners are made of an extremely hard cast alloy. They are positioned around the Blast Wheel to protect the Blast Wheel Housing. Since these Liners are in the path of Abrasive, wear is to be expected. Thus, Liners should be inspected often to determine when replacement is necessary. If Liners are allowed to wear through, the Blast Wheel Housing will quickly develop wear holes causing Abrasive leakage on and around the machine. <u>ALWAYS OPEN ELECTRICAL DISCONNECT PRIOR TO LINER</u>
<u>INSPECTION.</u>

The Top Liner is located on the uppermost section of the Blast Wheel Housing and is held in place by the (2) Bolts on the Housing Lid. The Side Liners are positioned on the front and backsides of the Housing and are attached using (4) Bolts, Lock Washers and Flat Washers. The End Liners are nest between both Side Liners under the Top Liner and are held in place by the (2) Bolts on the right and left ends of the Blast Housing.



CHECKING THE ROTATING ASSEMBLY FOR BALANCE & NOISE

The Blast Wheel Assembly should always run smoothly with very little vibration or noise. Excessive vibration of the Blast Wheel or unusual noise during operation should be investigated immediately. Vibration is an indication of an "out of balance" Blast Wheel. An "out of balance" Blast Wheel is caused by excessive wear or damage to internal rotating parts. When troubleshooting an "out of balance" Blast Wheel the Blades should be inspected first followed by the Impeller, and the Hub.

Damage to the internal rotating parts of the Blast Wheel usually occurs when Blades become worn through or broken and Abrasive enters the area behind the Blade. To inspect and replace the Blades and other parts of the rotating assembly, it will be necessary to partially or completely disassemble the Blast Wheel depending on the cause and remedy of the vibration or noise.

Motor failure or improper motor rotation could also cause excessive vibration or noise. A qualified electrical serviceman should do any motor repairs or replacements.



BLAST WHEEL DISASSEMBLY

Open the manually operated disconnect at the Control Panel and Tag Switch so that the machine cannot be energized

- 1. Remove Blast Housing Lid by loosening the Nuts on each end of the Lid, rotating the Clevis Brackets outward and lifting the Lid upward
- 2. Remove the Top Liner
- 3. Remove the Feed Spout by removing the two 3/8" hex head nuts holding it in place.
- 4. Remove the (2) 3/8-16 NC x 1" hex head bolts from the recessed slotted holes in the cage adapter.
- 5. Unscrew and remove the Socket Head Cap Screw inside the impeller. A special lock washer locks the screw in place. The control cage and centering place can now be removed.
- 6. The blast wheel blades can now be removed. If the blades are not badly worn, they can be used again.
- 7. To remove a blade push the blade toward the center of the wheel and rotate bottom of blade out until it is free from the block, then lift it out. Remove all the blades in this manner.
- 8. Inspect all parts, which have been removed to determine whether they are worn or damaged to the extent that replacement is necessary.
- 9. The Blast Wheel Hub has Blade Blocks mounted to it that hold the Blades in place. Blade Blocks do not wear very quickly if the Blades are maintained properly. The Blade Blocks are held on the Hub by a Roll Pin and a Cap Screw.
- 10. To Remove the Blade Blocks, use a ½" Allen Wrench to remove the Cap Screw and pull it off the Hub. When inspecting these parts, look for unusual wear around the Centering Plate and on the face of the Blade Block where the Blade locks into place. It may be necessary to replace the Blade Blocks if there is excessive wear in these areas. Blade Blocks must be replaced in full sets to avoid Blast Wheel balancing issues.
- 11. Replace Top Liner and Housing Lid. Bolt cover in place and run Blast Wheel rim (no abrasive).

NOTE: If the assembly runs smoothly and there is no noticeable noise or excessive vibration, no further disassembly will be necessary. The worn parts can be replaced and the Blast Wheel reassembled.



However if vibration or noise is still present it will be necessary to complete the disassembly and remove the Hub and follow these steps:

- 1. Loosen the Compression Cap Screws on the right and left side of the blast housing. The end liners can now be removed through the top and bottom of the blast housing. Tap the liner gently with a rubber or plastic mallet to ease removal.
- 2. Remove the (4) hex head bolts holding the hub seal in place. The hub seal is in two pieces and contains a felt seal.
- 3. Remove the (2) Allen Head Screws in the Taper Lock Bushing.
- 4. Re-install one of them in the third hole of the Bushing. Be sure the hole is free of any Abrasive. This hole is threaded only on the Bushing side, the side nearest the Motor Shaft. Tighten this Screw until the Hub is released from the Taper Lock Bushing. If the Hub does not release, tap on the face of the rim using a bronze drift and tighten the Screw again. When the Wheel Hub is loose on the Bushing, slide it forward off the end of the Motor Shaft.

NOTE: See Attached Dodge Instructions as a reference for removal of Taper-Lock Bushing.

- 5. Remove the Taper Lock Bushing and Key from the Motor Shaft
- 6. Clean the Motor Shaft and all Blast Wheel components.
- 7. Inspect the Keyway on the Motor Shaft and the Key for wear.
- 8. Inspect Front and Rear Side Liners for wear. If any of the Liners have worn to one half their original thicknesses they should be replaced. Remove the retaining bolts holding the Front Side Liner and remove. Repeat this step on the Rear Side Liner.
- 9. If the Blast Wheel Motor runs smoothly, the Blast Wheel can be reassembled. All badly worn parts should be replaced to assure a smooth running final assembly. If vibration still exists, the Motor may need to be repaired or replaced. Be sure all motor or electrical repairs or replacements are done by a qualified electrician or serviceman.



WHEEL ASSEMBLY INSTRUCTIONS

- 1. Replace the key in the keyway on the motor shaft.
- 2. Place the Taper Lock Bushing into the Wheel Hub.

NOTE: Only Dodge Bearings are recommended. See attached instructions for Taper Lock Bushing installation and torque recommendations.

- 3. Slide the assembly over the end of the motor shaft with the key properly aligned with the keyway in the bushing. Push the hub and taper lock bushing onto the shaft.
- 4. Slide the bare wheel over the end of the shaft and onto the register of the hub.
- 5. Fit the shear rings into each counter bore of each threaded hole of the blade block with the beveled side of the blade block facing toward the center of the hub.
- 6. Align the shear ring with the counter bored hole in the bare wheel and hub together using a ½-13 NC x 2" socket head cap screw. Continue this procedure with each blade block until all eight are mounted on the bare wheel.

Continue around using the outer bolt circle and eight $\frac{1}{2}$ -13 NC x 1" socket head cap screws. The holes in the outer bolt circle are accessible through cutouts in the blast wheel housing.

- 7. When the blade blocks are properly mounted and faced flush with the bare wheel, block the blast wheel against rotation with a wooden block and tighten the (14) socket head screws with a 3/8" allen wrench and extension handle. These allen-head screws should be tightened to 80 ft.-lbs. of torque.
- 8. Place the rear sideliner in position. Center the liner around the bare wheel and bolt in place.
- 9. Place the cage retainer inside the housing centering it with the large center hole of the housing front. Attach the cage adapter to the cage retainer using two 3/8-16 NC x 1" hex head bolts on the outer bolt circle.
- 10. Install the front sideliner making sure it in perfect alignment with the rear sideliner. This alignment is essential for the top liner and the ender liners to seal correctly.
- 11. The blades should be installed in a clockwise direction.
- 12. Attach the blades to the blade blocks in such a way as to have the blade face with the wide part of the shoe toward the inside next to the impeller.
- 13. Install the centering plate over the end of the motor shaft and slide into bore of the bare wheel.
- 14. Place the control cage inside the cage adapter. The notch in the outside rim of the control cage should be facing 180 ° away from the shot pattern.
- 15. Install the impeller inside the control cage matching up the notches in the impeller with the lugs on the centering plate. Install 5/8-11 NC x 1-1/2" socket head cap screw and the special lock washer in the threaded motor shaft.
- 16. Block the blast wheel rotation with a wooden block and tighten the screw to 60 ft. lbs. of torque.
- 17. The control cage can be adjusted and bolted in place. The control cage is held in place by (2) 3/8-16 NC x 1" hex head screws with flat and lock washers.
- 18. The screws and washers should be installed in the (2) recessed slotted holes in the cage adapter at the 3:00 and 9:00 position.



- 19. Move the assembly up and down and side to side until the spacing between the impeller and the control cage is equal all around.
- 20. Rotate the blades by hand to check for cage clearance. Repositioning of the cage adapter and cage retainer to obtain proper cage clearance may be necessary. Tighten the (2) 3/8" bolts to hold the assembly in place.
- 21. Rotate the blast wheel assembly by hand and check for noise or binding.
- 22. Install the top liner and replace the blast housing cover.
- 23. The end liners have sides and ends that interlock. They are located on the right and left ends of the blast wheel housing. The end liners are a slip fit between the sideliners. They should be installed with the offset arranged in such a way as to have the inside overlap extending at the top and placed flush with the top of the side liner. End liners can be positioned from the top or bottom to the housing. The longer end liner should be placed in the bottom of the housing, facing in the direction of the blade rotation. When the end liners are in place, tap lightly with a plastic to ensure proper fit against the top liner. Tighten the compression cap screws to hold end liners in place.
- 24. Install the (2) support studs into cage retainer. Make sure the studs do not extend past the cage retainer into the blast wheel area. Install the (2) 3/8" heavy hex nuts followed by the (2) washers.
- 25. Inspect the feed spout seal and replace if necessary.
- 26. Slide the slotted ears of the feed spout into place over the (2) support studs and fix it in place using (2) flat washers, (2) lock washers and (2) 3/8" hex head nuts.
- 27. Rotate the blast wheel assembly by hand and check for noise or binding.
- 28. Close manually operated disconnect switch.
- 29. After installation of the abrasive valve the blast wheel will be ready for operation.

NOTE: See instructions on Abrasive Control Valve Adjustment



ADJUSTING AND CHECKING THE BLAST PATTERN

The adjustment of the Blast Pattern is of the utmost importance. A poor adjustment will not only reduce cleaning efficiency but also increase maintenance and replacement costs. A Blast Pattern Test should be completed when the equipment is first put in operation, when any decrease in blast efficiency is noted, after any maintenance has taken place or if a change is made to the type (*or size*) of Abrasive material being used.

The Hot Spot is that area of the work surface receiving the greatest portion of the abrasive blast. It is visible by the discoloration caused by frictional heat. The Hot Spot should be directed toward the area of work to be blasted to give the most effective cleaning pattern. If not properly directed, abnormal wear of the equipment and parts may occur.

To check the location of the Hot Spot place a metal plate in the direct path of the Blast pattern at the average work height position. Blast the plate for 30 seconds and then immediately feel to locate the hottest spot. The plate is very hot after being blasted, it's important to be careful when feeling for the Hot Spot.

The Control Cage, located at the center of the Blast Wheel, receives the Abrasive from the Impeller through the static opening. The Control Cage, through the location of its opening, controls the point of delivery of the Abrasive to the Blast Wheel Blades. If the smaller line on the Control Cage rim face is set in a 12 o'clock position then each Blade will pick up Abrasive at this point and deliver it in a downward thrust at a point below the Blast Wheel (approximately 6 o'clock). The point of delivery may vary with different types and sizes of Abrasive.

To adjust the blast stream Hot Spot, the Control Cage must be rotated clockwise or counterclockwise. The line on the Cage should always be facing approximately 180 degrees away from the blast pattern. Rotating the Control Cage in a clockwise direction will move the Hot Spot clockwise; moving the Control Cage in a counter-clockwise direction moves the Hot Spot counter-clockwise. Initial adjustment should begin with the line in the 12 o'clock position. Final adjustment will usually be less than 1" from this point.

The pattern must always be checked at initial set-up under the condition the equipment will be operating.



ABRASIVE CONTROL VALVE

Correct adjustment of the Abrasive Control Valve is essential for maximum cleaning efficiency and maximum Blast Motor Life.

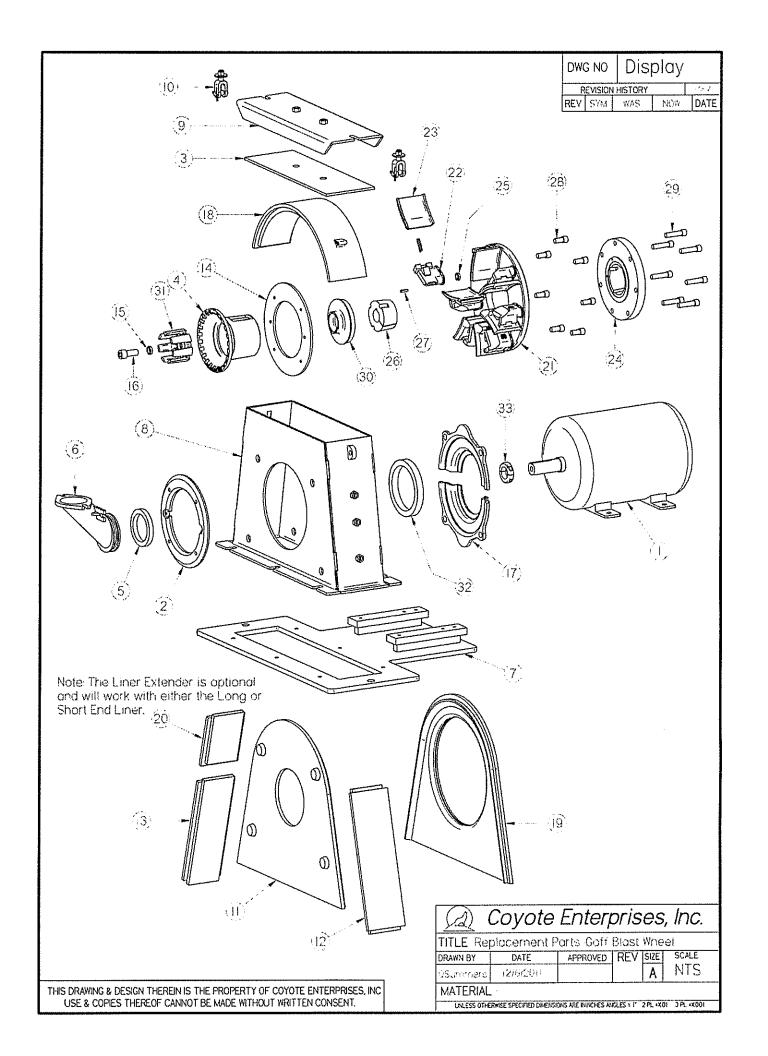
The Motor Load Amp Meter determines the abrasive flow adjustment. The Amp Meter registers the amperage load on the Blast Wheel Motor (see Motor Manufacturer's Nameplate for full load rating information). To obtain full Blast Wheel efficiency from an Amp Meter, the Amp Meter should always show a full load reading during the blast cycle. This reading can vary from one type of Abrasive to another.

When the Blast Wheel is running the Amp Meter reading should be constant and steady. Any severe fluctuations can be interpreted as an indication of bearing trouble, "drag" from moving parts of the Blast Wheel, Motor malfunction or electrical supply variances.

While the machine is in operation, any Amp Meter reading fluctuations should be investigated. Changes could indicate shortage of the Abrasive, stalled Elevator, clogged Screen or foreign objects in the Impeller. The Amp Meter serves as a prime indicator of proper or improper operation.

As the Abrasive Control Valve is opened, the amperage load will increase. The valve should be set so that the Motor will draw maximum rated amperage or run at 100 percent efficiency. Always run the Blast Motor at maximum efficiency (never overload). Monitor and adjust amperage as necessary.

An adjustable Stroke Air Cylinder operates the Valve Slide Plate. An Adjustment is made by loosening the jam nut and turning the Adjustment Bolt on the back of the cylinder. Turning the Bolt out allows more stroke by opening the Slide Plate which increases the abrasive flow and raises the amperage.



DWG NO		Dis	Display		
REVISION HISTORY				5 0c 5	
REV	SYM	WAS	NOW	DATE	

	,		
Item	Doc Num Title		Qty
1	C8100029 Motor 7.5 HP Blost Wheel		1
1	C8000546 Motor IO HP Blast Wheel		1
1	C8101030	Motor 15 HP Blast Wheel	
1	C8002796	Motor 20 HP Blast Wheel	
1	C8100048	Motor 25 HP Blast Wheel	1
1	C8100044	Motor 30 HP Blast Wheel	
2	C5100301	Cage Adapter Outer 12	1
3	C0002046	Liner Lid 12" BH	ı
4	C5000138	Control Cage-40 deg	
5	C5000302	Spout Seal	ı
6	C5000303	Spout 90 Degree (Shown)	i
6	3050045	Spout 45 Degree	1
6	1000000-A	Spout-Straight	
7	C0103091	Base Plate 7-1/2-10 HP (Shown)	1
7	C0100125	Base Plate-Goff 15/20 HP	1
7	4040086	Base Plate Std 25/30 HP	1
8	C0102045	Housing Blast Wheel 12	1
8	C0102045-AR	Housing Blost Wheel 12 AR400	
9	C0102041	Lid BH 12	ı
10	C6101159-A	Clevis-Yoke End Assembly	2
11	C5001939	Liner-Side F	l or 2
12	C5002308	Liner-End Long	1
13	C5001937	Liner-End Short	l or 2
14	C0000268	Cage Retainer Inner 12	1
15	C6000962	Washer-Lock-Hı Collar	ı
16	C7004114	Bolt Impeller 12, 5/8-11x1-1/2	1
17	C5100292	Seal-Hub 12	ı
18	C5001936	Liner-Top I2" (Shown)	1
18	C5001936-001L	Liner-Top Left	1

Item	Doc Num	Title	Qty
18	C5001936-002R	Liner-Top Right	1
19	C5001938	Liner-Side R	
20	C5000129	Liner-Cast-Extension-Housing	?
21	C0002428	Wheel Bear 12" (7BId)	1
21	C0044559	Wheel Bear 12" (8 Blade)	ı
22	C5100116-7R	Block CW Set 7 (116)	ı
22	C5101543-8R	Block CW Set 8 (116)	I
22	C5100117-7L	Block CCW Set 7	ı
22	C5101544-8L	Block CCW Set 8 (117)	1
23	C5102064-7	Blade Set 7, 12"	l
23	C5102063-7	Blade Set 7, 13.5"	ļ
23	C5101366-7	Blade Set 7, 15"	I
23	C5101540-8	Blade Set 8, 12"	ı
23	C5101541-8	Blade Set 8, 13.5"	ı
23	C5101542-8	Blade Set 8, 15"	ŀ
24	C000029I	Hub-12 7 Station	1
24	C0044560	Hub-12 8 Station	ı
25	C5000294	Shear Ring	#
. 26	C6000857	Bushing T/L 2517 x 1-3/8 Bore	ı
' 26	C6000956	Bushing T/L 2517 x I-5/8 Bore	J
27	C600053I	Pin - Roll I/4 x 7/8	1
28	C70039I0	Bolt-Blade Block-1/2 x 1" Lg	#
29	C7003920	Bolt-Blade Block-1/2 x 2" Lg	#
30	C5000137	Centering Plate	I
31	C5000136	Impeller 7 Blade-Goff Wheel	ļ
31	C5002103	Impeller 8 Blade-Goff Wheel	l
32	C0000293	Hub Seal-Goff 12" BW	1
33	3000268	Split Collar - 1-3/8"	

- # The quantity for items 15, 18 and 19 is determined by the number of Blades.
- * Determined by motor HP. 7-1/2 and 10 HP motors require the use of C6000857. 15, 20, 25, and 30 HP motors require the use of C6000956.

(2) Coyote Enterprises, Inc.					
TITLE Replacement Parts-Goff Blast Wheel					
DRAWN BY	DATE	APPROVED	REV	SIZE	SCALE
OSummers	12/6/2011			A	N/A
MATERIAL :					
UNLESS OTHERMISE SPECIFIED DIMENSIONS ARE INNICITES ANGLES + 1° 2.P. +X01 J.P. +X001					

THIS DRAWING & DESIGN THEREIN IS THE PROPERTY OF COYOTE ENTERPRISES, INC USE & COPIES THEREOF CANNOT BE MADE WITHOUT WRITTEN CONSENT.

TAPER-LOCK® Bushings

These instructions must be read thoroughly before installation or operation.

WARNING: To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

INSTALLATION:









120100

1006 to 3030

3535 to 6050

ı

- O Insert Screws to Install
- Insert Screws to Remove
- Clean shaft, bore of bushing, outside of bushing and hub bore of all oil, paint and dirt. File away burrs.
- 2. Insert bushing into hub. Match the hole pattern, not threaded holes (each complete hole will be threaded on one side only).
- "LIGHTLY" oil setscrews and thread into those half-threaded holes indicated by O on above diagram.

CAUTION: Do not lubricate the bushing taper, bushing bore, hub taper or the shaft. Doing so could result in breakage of the product.

- 4. Position assembly onto shaft allowing for the small axial movement which will occur during lightening procedure.
- Alternately torque setscrews to recommended torque setting in chart below.

CAUTION: Do not use worn hex key wrenches. Doing so may result in a loose assembly or may damage screws.

- To increase gripping force, lightly hammer face of bushing using drift or sleeve. (Do not hit bushing directly with hammer.)
- Re-torque screws after hammering.

CAUTION: Where bushing is used with lubricated products such as chain, gear or grid couplings be sure to seal all pathways (where lubrication could leak) with RTV or similar material.

8. Recheck screw torques after initial run-in, and periodically thereafter. Repeat steps 5, 6 and 7 if loose.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric nor are the responsibility of Baldor Electric. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

TO REMOVE:

- Remove all screws.
- Insert screws in holes indicated by on drawing. Loosen bushing by alternately tightening screws.

NOTE: If two bushings are used on the same component and shaft, fully tighten one bushing before working on another. When installing bushing in sintered steel product (sheave,coupling, etc.) follow torque recommendation shown on product hub if present.

Recommended Installation Wrench Torque				
Bushing No.	LbIn.	Nm		
1008 1108 1210 1215 1310 1610	55 55 175 175 175 175 175	6,2 6,2 19,9 19,9 19,9 19,9 19,9		
2012	280	31,8		
2517	430	48,8		
2525	430	48,8		
3020	800	90,8		
3030	800	90,8		
3525	1000	114		
3535	1000	114		
4030	1700	193		
4040	1700	193		
4535	2450	278		
4545	2450	278		
5040	3100	352		
5050	3100	352		
6050	7820	888		
7060	7820	888		
8065	7820	888		
10085	13700	1556		
12010	13700	1556		

NOTE: When using TAPER-LOCK bushings with conveyor pulleys, refer to the DODGE Instruction Manual for TAPER-LOCK, H.E., and QD Conveyor Pulley Bushings.





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Dodge Product Support

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